

BOSTON ZERO WASTE RECOMMENDATIONS:

DRAFT RECOMMENDATIONS OF BOSTON'S ZERO WASTE ADVISORY COMMITTEE – DECEMBER 2018

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LETTER FROM THE CO-CHAIRS

Dear Mayor Walsh,

On behalf of the Zero Waste Advisory Committee, it is our privilege to convey to you our recommendations on how the Boston community can move toward the goal of Zero Waste.

The Committee consists of representatives of all sectors of the Boston community: residents from across the city, neighborhood organizations, businesses large and small, institutions, and non-profit organizations. With the support of a team of expert consultants and City Hall staff, we have met regularly to review the current state of waste production and disposal in Boston, consider best practices for waste reduction from around the country, and weigh the costs and benefits of change. Then, using the Guiding Principles for Implementing Zero Waste in Boston developed by the Boston Zero Waste Summit in 2016 as our guiding framework, we derived the recommendations contained in this report.

The measures described in these recommendations will not get us to Zero Waste—that is, no waste sent to landfills or incinerators—but they will get us close. By applying the well-known mantra of Zero Waste, “Reduce, Reuse, Recycle,” these measures can open economic opportunities, increase efficiency, improve public health, and reduce carbon emissions. Some of them require investments; some, changes in laws, regulations, and enforcement. Most of all, they require a commitment to this important goal. We are confident that, under your leadership, this transition can happen.

Thank you for the responsibility that you gave us to undertake this work for our friends and neighbors in Boston. We look forward to working with you on the long work of implementation.

Sincerely,

Chris Osgood
Christopher Cook
Co-chairs, Boston Zero Waste Advisory Committee



1. INTRODUCTION

BACKGROUND

The City of Boston's Climate Action Plan update of 2014,¹ its blueprint for becoming carbon-neutral and climate-ready by 2050, called for the City to "launch a Zero Waste planning process" that would "identify strategies to move the City towards Zero Waste." In 2018, Mayor Walsh appointed a Zero Waste Advisory Committee to give him recommendations for measures on how the City can achieve this goal.

As defined by the Zero Waste International Alliance, Zero Waste is "the conservation of all resources by means of responsible production, consumption, reuse, and recovery of all products, packaging, and materials without burning them, and without discharges to land, water, or air that threaten the environment or human health."²

This report describes the Committee's process; its findings about reuse, recycling, composting, and reducing trash in Boston; and its recommended strategies.

ADVISORY PROCESS

The first step of the process pre-dated the appointment of the Zero Waste Advisory Committee. In 2016, the City of Boston, in partnership with the Zero Waste Boston Coalition (formerly Boston Recycling Coalition), held a Zero Waste Summit that led to the development of Guiding Principles for Implementing Zero Waste in Boston. (See Appendix.) These principles are:

1. Make Zero Waste a key priority.
2. Focus first on using less and diverting more.
3. Support this work through local business development.
4. Sustain this work through culture change.

Between February and December 2018, the Zero Waste Advisory Committee met four times to learn about Boston's existing trash and recycling system, examine best practices from around the country, and develop waste reduction recommendations. The Committee met as a whole, and also broke into sub-groups to discuss issues specific to the residential and commercial sectors. The Committee was supported by a team of technical and facilitation experts led by Perlmutter Associates, along with Zero Waste Associates and the Center for EcoTechnology, hired by the City. Staff from the Public Works and Environment Departments also lent their expertise to the process.

Research by the consultants helped the Committee develop these recommendations. White papers, presentations to the Committee, and various draft documents contain extensive



details about the current state and capacity of Boston's collection and processing infrastructure, costs and benefits of recommended strategies, case studies about how leading Zero Waste cities engage the public, and opportunities for economic development. All of these materials are posted on the City's Zero Waste website.³

In addition to the Committee's public meetings, over 40 community and business groups received presentations about the Committee's work.

EVALUATION CRITERIA

The Guiding Principles described above provided the framework for the Committee's work. In addition, the Committee used a broader set of evaluation criteria that are similar to the criteria used in other recent City planning, including Imagine Boston 2030, Climate Ready Boston, Resilient Boston, and Go Boston 2030. Potential waste reduction strategies were evaluated for:

1. **Effectiveness:** the amount of change in reduction of trash and increase in reuse, recycling or composting.
2. **Economic feasibility:** the public and private costs, industry's capacity to take on changes, and potential markets for recycled products.
3. **Convenience:** time, attention, and effort required to make a change.
4. **Equity:** impact across Boston's diverse neighborhoods and population.
5. **Economic development:** effects on jobs, wages, and the creation of new businesses.
6. **Legal and institutional feasibility:** existing authorities, regulations, and institutional requirements involved in making changes.
7. **Other benefits:** impact on public health, beautification, energy use, and carbon emissions.

2. CURRENT COLLECTION SYSTEM

CURRENT RESIDENTIAL COLLECTION IN BOSTON

The residential trash, recycling, and composting programs in Boston are primarily the responsibility of the Public Works Department, with support from the Inspectional Services and Environment Departments.

Residential trash, recycling, and leaf and yard trimmings collection is performed by private haulers contracted by the Public Works Department and paid for by tax revenue. Most residential buildings receive trash and recycling collection once per week. Downtown neighborhoods receive twice per week trash and recycling collection services. Options for residents for trash, recycling, and composting include:

- Trash can be set out for pickup in customer-provided cans or plastic trash bags.



- Recyclable materials are commingled (paper, glass, plastic and metal are collected together in “single-stream recycling”) and can be set out in wheeled carts provided by the City, customer-provided containers with a recycling sticker, or, for residents in the downtown, clear plastic bags.
- Residents’ leaves and yard waste are collected curbside in leaf bags or open barrels from April to early December.
- The City hosts four events per year where residents can drop off hazardous materials (for example, paints, oils, and pesticides), clothing and textiles, electronics, and paper for shredding.
- The City offers five “Project Oscar” community compost bins for food scrap collection located throughout the City.

CURRENT COMMERCIAL COLLECTION IN BOSTON

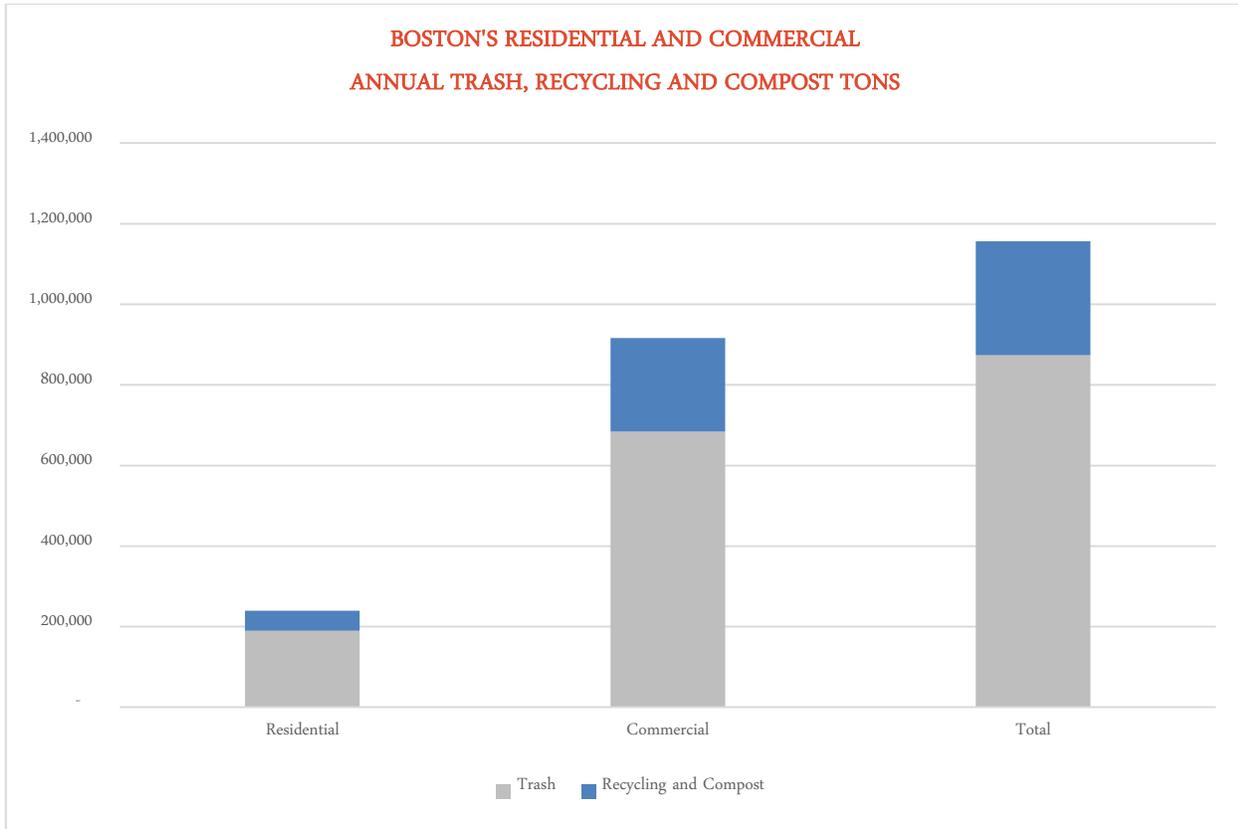
Businesses and institutions in Boston hire private haulers to collect their trash and recyclable and compostable materials. Trash haulers must receive permits from the Public Works Department under the City’s commercial Trash Hauler Ordinance to collect materials from cubic yard dumpsters, compactors and large roll-off containers. Haulers do not need a permit to collect trash and recyclable materials from commercial customers that use smaller bins or wheeled carts. Customers and haulers determine the size and frequency of containers and collection. Materials may be hauled directly to processing and disposal facilities or transferred to long-haul trucks through private transfer stations.

Nearly four-fifths of all discarded materials generated in Boston are from businesses and institutions; the rest is from residents.

CURRENT RECYCLING RATE

The citywide recycling rate, which includes all materials collected from residents, businesses and institutions that are reused, recycled or composted, is approximately 25 percent. This amounts to about 282,000 tons of materials diverted from disposal annually. The remaining 75 percent, 874,000 tons, goes primarily to waste-to-energy incinerators (facilities that burn trash to generate energy); some may go directly to landfills.



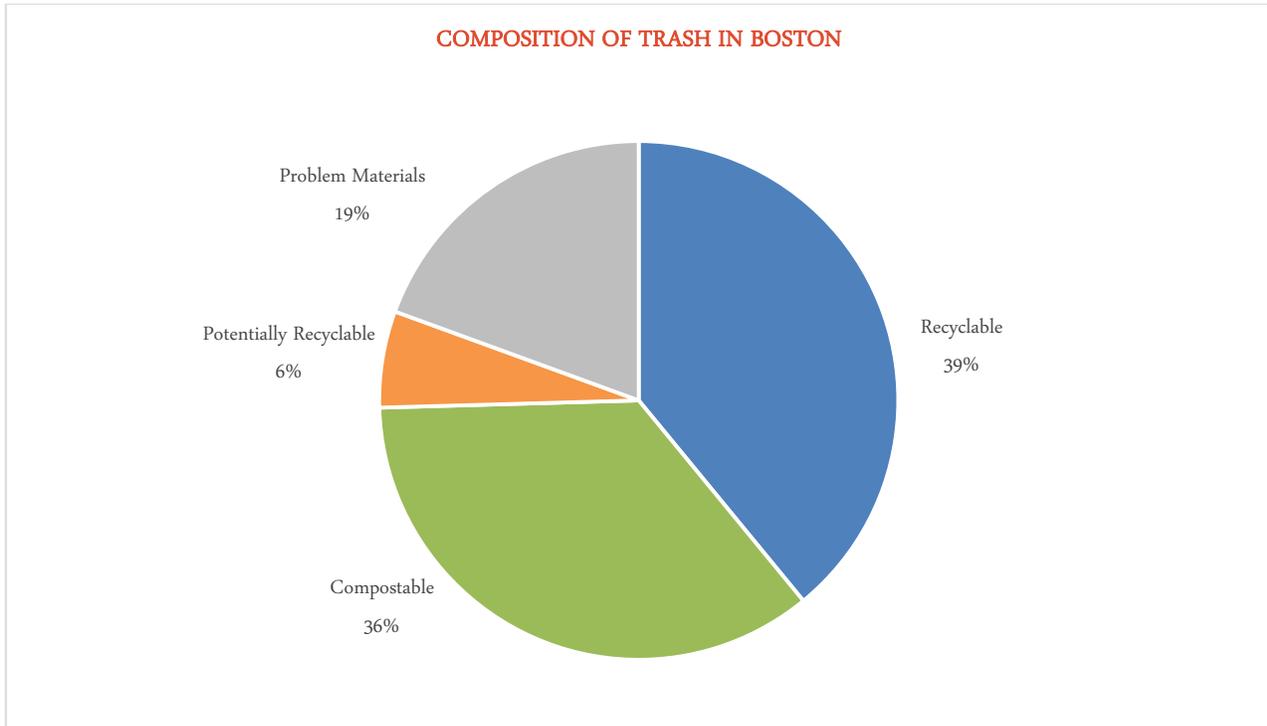


Source: Perlmutter Associates 2018, derived from Boston Public Works Department, FY 17 Actual Tonnages and Tip Fee by District, Mass DEP Solid Waste Data Update, includes MSW, C&D and Non-MSW disposal 2014; California Commercial Generator Waste Study based on Tons Per Employee Per Day

COMPOSITION OF TRASH IN BOSTON

Though Boston residents, businesses and institutions currently only reuse, recycle, or compost 25 percent of their discarded materials, at least 75 percent of what is disposed as trash is potentially recyclable or compostable. This estimate comes from statewide studies of the composition of the trash disposed at landfills and incinerators. Recyclable materials include paper, plastic, metals, glass, and textiles. Compostable materials include food, food-soiled paper, plant debris, wood, and soils. Potentially recyclable materials include materials that are recyclable from a technical standpoint, but may not have a strong infrastructure or collection system yet, such as expanded polystyrene (i.e., Styrofoam®) and plastic bags. Problem materials include things that can't be reused, recycled or composted now due to high cost, or lack of technology or markets, such as treated wood, diapers, and composite materials (items made of multiple materials).





Source: Perlmutter Associates, derived from 2016 Waste Characterization Study in Support of Class II Recycling Program (Saugus, SEMASS, Haverhill)

BOSTON'S PROCESSING CAPACITY

There are many facilities in and around Boston that recover and process the City's materials. These include:

- Food rescue and donation organizations
- Reuse and repair facilities
- Material recovery facilities for processing recyclable materials
- Construction, demolition and deconstruction processing facilities
- Composting and anaerobic digestion facilities
- Other facilities that handle specialty materials (for example, mattresses)

A summary of issues relating to materials processing capacity in Boston is below. Overall, lack of capacity is not a big concern except possibly for compostable materials. However, this could change if material quality is not made a priority, increased rent or continued development causes facilities to close, or materials markets do not improve. Satisfactory capacity does not mean there are not opportunities to create new industries in the City to manage the City's materials.



STATUS OF BOSTON'S CURENT ZERO WASTE INFRASTRUCTURE

Food Rescue and Donation	Capacity OK. Rescue groups want more food. They would like help in promotions and streamlining enforcement.
Reuse and Repair Facilities	Capacity OK. Lack of space, changing zoning, and rising rents may impact capacity in the future.
Materials Recovery Facilities	Facilities are slowing down sorting lines, running materials through lines more than once, adding equipment, shifts and more labor to meet higher quality standards; companies are considering adding more capacity.
Construction, Demolition & Deconstruction Processing Facilities	Capacity OK. Landfills that take residuals from processing facilities are closing. Will be important to develop markets/uses for those residuals.
Composting facilities	No permitted facility in or near the City has the capacity to take all of the City's food scraps and soiled paper.
Anaerobic Digesters	There is capacity at Waste Management's CORE processing facility and Greater Lawrence Sanitary District to process Boston's food scraps. In addition, at least one private company is interested in siting an anaerobic digestion facility in the City that could take mixed yard trimmings, soiled paper, and food scraps, without sewage sludge. No facilities currently digest soiled paper.
Special Materials (rigid & film plastics, electronics, and household chemicals)	Capacity OK. Markets for some types of plastics may be an issue. In addition, lack of space and cost has limited creation of a permanent Household Hazardous Waste facility (for household chemicals like paint, motor oil, pesticides, and cleaning agents).



3. RECOMMENDATIONS

There are significant opportunities to reduce trash and increase reuse, recycling, and composting collection and processing in Boston. These opportunities include:

- Supporting and expanding businesses that can reuse, recycle, or compost the 75 percent of materials in the trash that are reusable, recyclable or compostable.
- Modernizing trash and recycling systems to be more efficient, effective, and equitable.
- Increasing education and awareness about trash reduction and proper recycling.
- Developing programs to collect additional materials.
- Linking waste reduction with economic development to support existing jobs and businesses and create new ones.
- Enacting policies (such as bans, fees or new rules) that support waste reduction.
- Collecting better data to identify where to set priorities and to modify policies and programs.

To address these opportunities, the Zero Waste Advisory Committee recommends that the City focus on 27 strategies within four core categories:

1. Reduce and Reuse
2. Recycle More
3. Increase Composting
4. Inspire Innovation

Across these four categories, there are 17 near-term strategies the City can advance in the next five years, and 10 longer-term strategies that the City should continue to explore.

These strategies reflect the levers that City government has to help the community get to Zero Waste: build a culture of Zero Waste; implement programs and policies that encourage Zero Waste; and encourage the development of business and infrastructure that support Zero Waste.

By implementing these strategies, the City can increase its overall recycling rate from 25% to 80% or more.



REDUCE AND REUSE

Reducing the creation of materials that wind up being discarded in the first place is the highest priority because it achieves the greatest environmental benefit. Right now, Boston's residents and businesses generate roughly 1.2 million tons of materials annually (25% is reused, recycled or composted and 75% is disposed in landfills and incinerators). Through the efforts below, that number can be reduced.

SHORT-TERM STRATEGIES

1. Conduct Citywide Public Education Campaigns

Develop campaigns to increase waste-reduction behaviors including: promotional campaigns in multiple languages, use of advertisements and Public Service Announcements, creation of how-to guides, uniform messages, universal recycling and trash signs, website resources, and mobile apps. Recognize individuals and institutions who are leading the way, building off of the Mayor's successful Greenovate Waste Reduction Awards.⁴

2. Provide Targeted Waste-Reduction Outreach and Technical Assistance

Inform residents, businesses and institutions of waste-reduction opportunities, services and rules. Promote resources such as the MassDEP Recycling IQ Kit,⁵ RecycleSMART⁶ and integrate strategies into Greenovate Boston.

3. Reduce Problem Products & Packaging

Building off of the City's plastic bag ban, explore policies that can reduce the use of foodware or packaging that is hard-to-reuse, -recycle or -compost.

4. Divert More Reusable Goods

Convene existing reuse and surplus food donation businesses and nonprofit organizations. Identify and implement ways in which the City can support their efforts.

LONG-TERM STRATEGIES

5. Divert Even More Reusable Goods

Increase the diversion of reusable goods including curbside pickup by appointment or on a regular basis, and voluntary take-backs at local retailers.

6. Keep Repairable Products from Disposal

Explore programs, events and policies that divert products that can be reused, repaired or easily dismantled from the trash.



RECYCLE MORE

Nearly 40% of what is tossed as trash in Boston today could have been recycled. Over 340,000 tons of these materials generated annually can be made into new products. This includes materials that are typically considered recyclable such as paper, plastic, metal, and glass, and also materials thrown away at construction sites like wood, drywall, bricks, concrete and asphalt.

SHORT-TERM STRATEGIES

7. Expand and enforce State and Local Recycling Requirements

Require residents and businesses to separate their recyclable materials from trash. Explore incentives such as providing City-sponsored trash collection services to multifamily and mixed-use buildings only when they meet minimum recycling standards.

8. Reinforce Waste-Reduction Goals through the Collection System

Phase in standard sized wheeled carts for trash collection where appropriate.

9. Create New Commercial Hauler and Generator Rules

Require all commercial haulers to provide minimum levels of recycling collection services to all of their commercial customers.

10. Make Recycling More Available in Public Places

Expand the number of recycling containers paired with trash containers at public facilities (e.g. City buildings, parks, schools) and with compost containers, if food is served nearby.

11. Expand Recycling During Construction Projects

Explore approaches that increase deconstruction, recycling and source separation at construction and demolition sites. Potentially require recycling plans, phased in by type and size of project.

12. Increase Transparency About Costs

Identify ways to show the financial impacts of not recycling, potentially leveraging existing opportunities such as the City's budget and property taxes bills.

13. Expand Infrastructure for Recycling "Hard to Recycle" Materials

Explore expanding the City's paint drop-off program and similar services or creating neighborhood drop-off centers for recyclables and hard-to-reuse, -recycle or -compost materials. Make the new system more accessible, particularly to those who live in apartments or work in small businesses.

LONG-TERM STRATEGIES

14. Make Public Events Zero Waste



Require managers of large venues and organizers of public events to provide recycling and compost collection and adopt best practices.

15. Create a More Equitable Collection System

Redesign the residential collection system to a more equitable, cart-based system that incentivizes reduction, reuse, recycling and composting.

INCREASE COMPOSTING

Over 35% of what is currently thrown away is compostable. This is nearly 310,000 tons of materials generated each year that could be composted and reused for other purposes. In addition, compost itself can help store carbon in the soils and reduce the amount of carbon dioxide in the atmosphere.

SHORT-TERM STRATEGIES

16. Expand Residential Yard Waste Options

Provide a residential yard waste collection or drop-off option for as many months as needed.

17. Pilot Programs to Handle Residential Food Scraps

Design and phase in, over the course of several years, programs to divert food scraps and food-soiled paper from household trash.

18. Increase Compost Capacity

Continue to explore and encourage the development of businesses that expand local compostable material processing capacity and options.

LONG-TERM STRATEGIES

19. Take Residential Composting Programs to Scale

Based on an evaluation of the composting pilots in the first five years, take the effective residential composting programs to scale.

20. Increase Commercial Composting

Require haulers to collect food and food-soiled paper for composting from their commercial customers.

INSPIRE INNOVATION

To get to Zero Waste – and to provide a model for other municipalities to do the same – will require further product, technology and business model innovation. Boston can take steps to spark that innovation here.



SHORT-TERM STRATEGIES

21. Expand the City's Environmentally Preferable Purchasing Practices

Update the 2008 Executive Order and guidelines on sustainable food, waste reduction, and environmentally preferable purchasing. Train and support staff in waste reduction and environmentally preferable purchasing. Expand environmentally preferable purchasing through use of state contracts and vendors for sustainable products. Require City agencies to use City-made compost or purchase compost and other soil amendments from local composters where possible.

22. Set Zero Waste Reduction Goals and Metrics

Monitor and annually report diversion, waste reduction, and other quantities for the city as a whole and municipal operations specifically.

23. Advocate for Redesign and Take-back of Products

Advocate for redesign and take-back of products that are not reusable, recyclable or compostable (including paint, mattresses and electronics). Participate in the Massachusetts Product Stewardship Council and Product Stewardship Institute.

LONG-TERM STRATEGIES

24. Fund New Ideas and Approaches

Provide community and business grants for waste reduction, reuse, repair, recycling and composting outreach and business development.

25. Support a Zero Waste Research and Development Network

Organize a network of businesses and organizations to share best practices, organize workshops and webinars, and expand research to innovate and find solutions for hard-to-reuse, -recycle or -compost materials.

26. Create a Zero Waste Economic Development Strategy

Support development of new reuse, recycling and composting processing, manufacturing and retail businesses and robust markets (including collection, repair, resale, and manufacturing) for reusable, recyclable and compostable materials. Develop job training programs that support waste-reduction activities. Support measures to improve the safety, health, and jobs of workers in waste-reduction activities.

27. Explore the Feasibility of City Owned Trash and Recycling Infrastructure

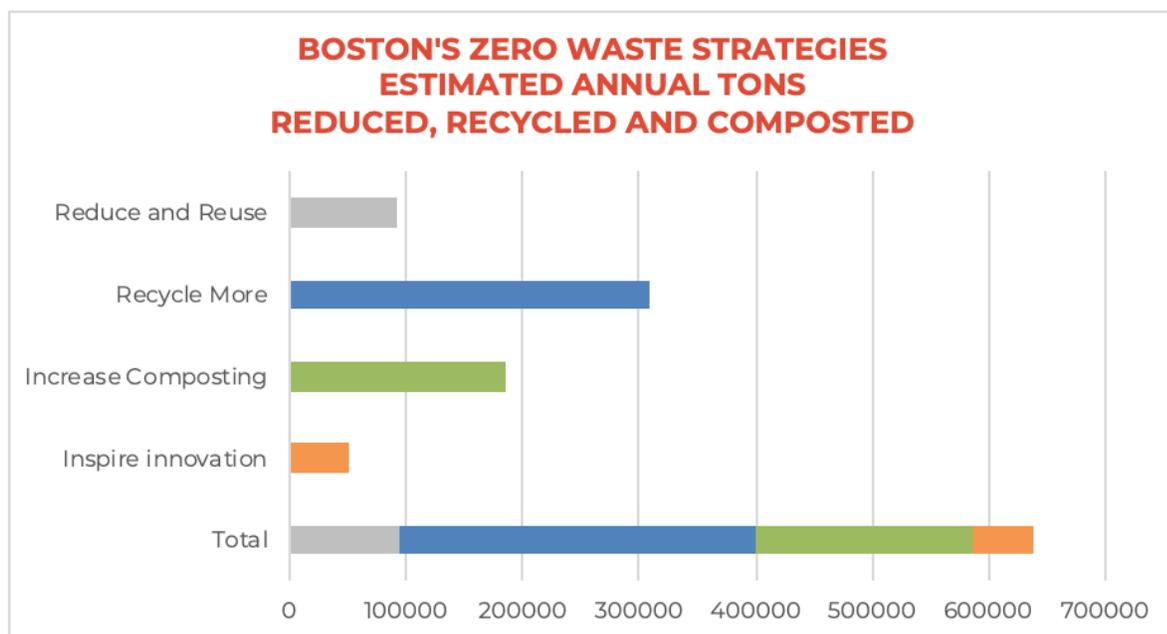
Identify potential sites for a City-owned transfer and processing facility or existing facilities that could be purchased, then conduct study to evaluate their feasibility.



4. IMPACT

RECYCLING RATE ESTIMATES AND GREENHOUSE GAS EMISSIONS REDUCTION POTENTIAL

Implementing the recommended strategies will reduce trash, and increase recycling and composting by about 638,000 tons per year or 55 percent. This would increase the City's overall recycling rate from approximately 25 percent to 80 percent. For comparison, current recycling rates in other leading Zero Waste cities are: San Francisco (83 percent), Los Angeles (76 percent), Seattle (59 percent), and Austin (42 percent).



Source: Perlmutter Associates, 2018

Waste prevention, recycling, and composting activities also reduce greenhouse gas emissions. If fully implemented, these Zero Waste strategies would result in a cumulative emissions reduction of roughly 7.8 million metric tons of carbon dioxide equivalent (Mt CO₂e) between 2020 and 2050 (58 percent decrease) compared to the 2017 baseline. Cumulative avoided emissions are estimated to total 17.1 Mt CO₂e (85 percent increase over baseline).⁷

CITYWIDE ZERO WASTE BOSTON AVOIDED EMISSIONS (KT CO₂E)

	2017 Baseline	2050 Zero Waste Strategies	Percent Change
Energy Recovery	174.5	8.0	-95.9 %
Material Recovery	170.7	429.7	154.5 %
Carbon Storage	324.9	989.1	204.4 %
Total GHG Savings	670.2	1426.8	107.1 %



Source: Boston University, 2018

5. IMPLEMENTATION

GOALS AND MILESTONES

Full implementation of the Zero Waste strategies identified in this recommendations will increase the City's recycling rate from 25 percent to 80 percent.

The Zero Waste Advisory Committee recommends that the City adopt a goal of reaching an overall recycling rate of 80% by 2035 and 90% by 2050. The mid-term goal is achievable based on implementation of these Zero Waste strategies and the experience of other Zero Waste leadership communities. The long-term goal is consistent with the City's ambitious goal of carbon neutrality by 2050. The composition of materials in the trash stream has evolved over the years and will continue to do so. End-markets will also change. The City will continually look at the materials in the trash and match them to the best strategies to meet these goals.

The following timeline lists each Zero Waste strategy and the recommending timeframe for implementation.



BOSTON'S ZERO WASTE TIMELINE

Short-Term 2019-2024

Long-Term 2025-2035

Reduce and Reuse

1. Conduct Citywide Marketing Campaigns
2. Provide Targeted Waste-Reduction Outreach and Technical Assistance
3. Reduce Problem Products & Packaging
4. Divert More Reusable Goods

Reduce and Reuse

5. Divert Even More Reusable Goods
6. Keep Repairable Products from Disposal

Recycle More

7. Expand and Enforce State and Local Recycling Requirements
8. Reinforce Waste-Reduction Goals through the Collection System
9. Create New Commercial Hauler and Generator Rules
10. Make Recycling Available in Public Places
11. Expand Recycling During Construction Projects
12. Increase Transparency About Costs
13. Expand Infrastructure for Recycling "Hard to Recycle" Materials

Recycle More

14. Make Public Events Zero Waste
15. Create a More Equitable Collection System

Increase Composting

16. Expand Residential Yard Waste Options
17. Pilot Programs to Handle Residential Food Scraps
18. Increase Compost Capacity

Increase Composting

19. Take Residential Composting Programs to Scale
20. Increase Commercial Composting

Inspire Innovation

21. Expand the City's Environmentally Preferable Purchasing Practices
22. Set Zero Waste Goals and Metrics
23. Advocate for Redesign and Take-back of Products

Inspire Innovation

24. Fund New Ideas and Approaches
25. Support a Zero Waste Research and Development Network
26. Create a Zero Waste Economic Development Strategy
27. Explore the Feasibility of City Owned Trash and Recycling Infrastructure



DATA AND REPORTING

Measuring performance will be an important part of determining the pace of implementation and the need to adjust policies and programs. For the residential sector, more complete and accurate data could also help to attract more potential contractors, who would have more confidence in calculating prices for services.

Through the City's own data collection and through requirements for contractors and permit holders, it is important to track the quantities of:

- Trash collected and disposed.
- Recyclable materials collected and marketed, minus any residue disposed.
- Compostable materials collected and processed, minus any residue disposed.
- Unit counts for bulky items and other reusables collected.
- Products and materials repaired and reused.

In addition to the total amount of materials collection and the overall recycling rate, it would be useful to measure three other metrics:

- **Disposal per capita:** Because Boston's population and economy are growing rapidly, it is possible that Boston could increase its recycling rate, but still increase the total amount of discarded materials generated in the City. It is important to monitor both the overall quantity of disposal and the quantity per person and per dollar of economic activity. This metric also provides a good way to see how the City is performing compared to other communities around the country as more of them adopt this metric.
- **Value to local economy:** The recommended strategies will spur economic activity by recovering value from materials that are currently being discarded, creating and retaining jobs in reuse, recycling, and composting services, and opening up opportunities for innovation and efficiency. To the extent feasible, the City should track the economic effects of these initiatives.
- **Carbon reduction:** Waste reduction and recycling contribute to the City's carbon reduction goals. The City can reduce greenhouse gas emissions by 7.8 million between 2020 and 2050 through implementation of the recommended Zero Waste strategies.

REGIONAL COORDINATION

Since materials don't necessarily stay within municipal borders, and because some businesses that utilize materials diverted from disposal need more materials than the City alone might generate, waste reduction will require regional coordination and cooperation. Programs through the Commonwealth and through organizations such as the Municipal Mayors Coalition are important to continue and expand. Significant areas to collaborate on are expanding recycling and composting capacity, economic development strategies, and outreach efforts to reduce contamination and encourage all to reduce and recycle correctly and create a culture of Zero Waste.



FUNDING

Fully implementing the strategies in these recommendations would require increased staff support, collection and processing of recyclable and compostable materials, and development of new Zero Waste infrastructure.

Many of the waste-reduction initiatives will reduce costs through avoided collection and disposal fees and greater efficiencies. The cost savings can be used to invest in other measures that may not have immediate payback.

Costs within waste management sector are in flux. Based on currently available data, as much as \$55 million in annual residential and commercial program costs citywide (for implementation, collection and processing) could be needed to fully implement these recommendations. However, an estimated \$40 million could also be saved annually through reduced trash collection and disposal costs. The net cost amounts to roughly \$5 per household or business per month.

Supplemental or alternative funding could be obtained from existing grant programs, such as:

- MassDEP Recycling Dividends and other grant programs.⁸
- The Recycling Partnership.⁹
- State or City workforce development funds.

Funding could also be obtained through:

- Fees on products or producers as included in some of the recommended initiatives.
- Payments of environmental fines directed to Zero Waste programs.
- Development of project conditions and mitigation fees to spur private investments.
- New permitting requirements for commercial trash haulers.
- Enforcement of recycling requirements.



6. CONCLUSION

Pursuing the goal of Zero Waste will make Boston, and its residents, businesses, and institutions, more efficient, resilient, and sustainable. It will make the City healthier for its residents and for its economy. It will contribute to the City's goals for climate and environmental protection. Phased in over time, the waste-reduction strategies will require change in behaviors at home, work and school, and in financial and intellectual investment. The rewards are many.

The City will play a key role in developing the policies, programs and infrastructure for Zero Waste and developing incentives and outreach programs to make it easy and convenient to participate.

By implementing the strategies in these recommendations, Boston will become a leader in Zero Waste, and will inspire innovation from all sectors and throughout the region that will reinforce its ability to meet its Zero Waste goals.

The Boston community is ready to take on this challenge.

1. https://www.cityofboston.gov/images_documents/Greenovate%20Boston%202014%20CAP%20Update_Summary_tcm3-49733.pdf
2. <http://zwia.org/standards/>
3. <https://www.boston.gov/departments/environment/zero-waste-boston>
4. <http://www.greenovateboston.org/2017greenovateawards-waste>
5. <https://www.mass.gov/how-to/massdep-recycling-iq-kit>.
6. <https://recyclesmartma.org>
7. Boston University Municipal Solid Waste and Wastewater Analysis for the City of Boston, 2018
8. <https://www.mass.gov/service-details/massdep-waste-recycling-grants-assistance>
9. <https://recyclingpartnership.org/>



APPENDIX

Guiding Principles for Implementing Zero Waste in Boston

October 27, 2016

Prepared for

Martin J. Walsh, Mayor of Boston

Prepared by

Department Representatives from the City of Boston and the Boston Recycling Coalition

In 2015, the City of Boston with its partners in the Boston Recycling Coalition received a grant from the Commonwealth of Massachusetts Department of Environmental Protection to hold a zero waste summit and, based on those discussions, develop a set of guiding principles that would assist the City in reaching a long-term goal of zero solid waste.

Vision

Boston is a leader in waste reduction by 2022.

State of Waste in Boston

The Boston community generates over 600,000 tons of solid waste annually. About 60 percent of the waste comes from commercial, institutional, and industrial activities. 40 percent of waste is generated by residents. Since FY2008, when the City launched its “Recycle More, Trash Less” campaign, Boston residents have increased their diversion (recycling) rate from 12 percent to 21 percent in FY2016. City government operations account for about one percent of all waste, and three-quarters of that is from public schools.

The City’s 2015 Climate Action Plan Update includes the strategy “Make progress toward a waste- and litter-free city,” with the associated action, “Launch a zero waste planning process.”

Guiding Principles

1. Make Zero Waste a Key Priority

Boston will create a waste policy that mitigates climate change, reduces climate emissions and other environmental and public health impacts, saves money, supports economic mobility and creates good jobs for Boston residents. As part of this work, the City will:

- Define the Goal
- Boston will build from the Zero Waste International Alliance’s definition of zero waste to define the goal.
- Develop a Strategy

- Boston will establish a plan to advance zero waste in all sectors of the Boston community. Implementation of this plan would start in Fiscal Year 2018. The plan will include specific metrics, milestones, and timelines.
- Expand Resources For Change
- Whether through partnerships, policies or direct funding, Boston will expand support for zero waste engagement, education and enforcement.
- Work Collaboratively
- Recognizing that this is a shared challenge, Boston will work collaboratively with other communities in the region and other major U.S. cities in this work.

2. Focus First on Wasting Less, Diverting More

Through this plan, Boston will develop and adopt policies that will support waste reduction; significantly increase repair, reuse, recycling, composting, and remanufacturing; and enable the City to meet its zero-waste milestones. As part of this work, the City will:

- Lead by Example
- While accounting for roughly only 1% of the city's total waste, the City of Boston recognizes it has an opportunity and responsibility to lead by example. Consequently, the City will examine and implement policies to reduce, reuse and recycle more. This may include - among other actions - using municipal procurement to support zero-waste goals; evaluating city contracts for waste reduction opportunities; creating model waste reduction and recycling programs at all City properties and facilities, including schools and housing; and engaging all City departments in zero-waste planning and implementation.
- Facilitate Residential Waste Reduction
- Residential waste accounts for about 40 percent of the city's waste stream, and the City manages contracts that provide waste and recycling services to all Boston residents. The City will work with service providers, Boston residents, and large residential building owners and property managers to identify changes that support zero waste goals. It will also continue discussions with regional stakeholders to develop regional zero-waste solutions.
- Engage Large Generators of Waste
- 60% of waste comes from commercial, industrial and institutional partners. The City will work with the largest waste generators, such as colleges, universities, hospitals, and commercial businesses to waste less and divert more. The City will explore incorporating zero-waste requirements into major permitting, planning, and project reviews.

3. Support This Work Through Local Business

Recognizing that the successful implementation of a zero waste system requires not just local policies but a local industry, the City will work with workers and businesses to ensure that they are prepared to support these new policies.

This may include working with job training programs to include needed zero waste skills; supporting new and emerging zero-waste jobs for Boston residents, including youth; and drawing on Boston's leadership in technological innovation and research to put discarded



materials to their highest and best use.

Throughout this work, the City will encourage measures to improve the safety, health, and jobs of workers.

4. Sustain This Work Through Culture Change

Acknowledging that achieving and sustaining zero waste will be a collective accomplishment, the City of Boston will focus on how to build a culture of zero waste, citywide. This will include engaging meaningfully with all stakeholders in a Zero Waste planning process; embracing industry workers, communities of color, low-income communities, and youth as critical Zero Waste partners; conducting large-scale, linguistically and culturally appropriate public education; and growing the next generation of zero-waste leaders by developing youth specific programs.

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